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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/590,566	08/24/2006	Jean Abascal	ABASCAL1	8579

1444 7590 07/06/2009

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EXAMINER	
BRUTUS, JOEL F	

ART UNIT	PAPER NUMBER
3768	

MAIL DATE	DELIVERY MODE
07/06/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/590,566	ABASCAL, JEAN	
	Examiner	Art Unit	
	JOEL F. BRUTUS	3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saurel et al (US Pat: 5,123,418) in view of Mayol et al (US Pat: 5,357,963) and further in view of Pourcelot et al (US Pat: 4,605,009).

Regarding claims 1-3, Saurel et al teaches a micro-echographic probe for ultrasound collimation through a deformable surface, comprising, at one end, an ultrasonic wave beam transducer and, at the other end, a convex tip for contact with the surface, characterized in that ultrasonic waves are of a frequency equal to at least 20 MHz and in that transducer is disposed directly on a piece of a preferably isotropic and little-absorbent material, which piece is continuous up to said contact tip, machined directly therein, so that waves converge directly from the transducer having any particular arrangement for this towards a focus which merges best with that of said contact tip, determined by the nature of said material, that of said contact surface and the frequency of the waves emitted. In a particular embodiment, the transducer is in the form of a spherical cap machined directly in said piece made of isotropic material [see column 2 lines 45-64]. Saurel et al teach in figs 1-4, the generatrix that a curve shape

and the director axis corresponds to the axis of rotation of the transducer and able to come into contact with a structure to be examined [see figs 1-4]. Figs 1-4 also disclose the generatrix has a circular face; and the probe comprises at one end an ultrasonic wave beam transducer, disposed in the form of a spherical cap [see abstract].

Saurel et al further teaches one application of the invention is the micro-echographic analysis of materials with deformable or plastic surfaces, such as tissues or organs close to the skin or accessible by endoscopic route in human beings or higher animals, as well as in insects and in the plant domain [see column 1 lines 13-18]; a probe comprising one or more lens, on one side filled with gel or liquid, and on the other side constituted by a material ensuring transmission up to contact with the object [see column 2 lines 5-9].

Saurel et al doesn't teach a piezoelectric assembly for focusing emitted beams and actuating means to perform displacement.

However, Mayol et al teaches a recess in the body contains an ultrasound transducer, generally constituted by a piezoelectric ceramic and connected to electronics by means of a cable that passes through the gap between the envelope and the housing [see column 3 lines 35-40]. Mayol et al teaches a magnetic drive device enabling a member placed on one side of a non-magnetic wall to be driven by a rotary drive shaft placed on the other side of the wall [see abstract].

However, Pourcelot et al teaches piezoelectric elements that are supported, in a known way, by a mass 32 of damping material for absorbing the energy emitted by the elements rearwardly and for rapidly absorbing the vibrations of these elements, so as to

widen the pass band and optimize the axial resolution. To the front face of the piezoelectric element array is bonded a matching layer 33 having a thickness equal to a quarter of the wave length of the ultra sounds in the material which forms it. Finally, for focusing the acoustic beam 34 emitted by a group of elements 35 during the same burst, in the transverse direction with respect to the plane of symmetry, an acoustic lens 36 is bonded to the matching layer 33. Lens 36 is advantageously formed from a material in which the speed of propagation is less than the speed in the tissues (about 1500 m/s). A material will for example be chosen in which the speed of propagation is about 1000 m/s. Thus, focusing is obtained with a convex shape of the acoustic lens 36 (FIG. 4). The external face of the flat convex lens will be very little different from the curvature of the end section 14 of the endoscope [see column 3 lines 36-57].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine these references by using the magnetic drive device as taught by Mayol et al and the piezoelectric elements as taught by Pourcelot et al; to ensure good matching and good contact with the wall of the cavity to be explored.

Regarding claims 4-7, all other limitations are taught as set forth by the above combination.

Saurel et al is silent to hall-effect sensor and rotary drive plates.

However, Mayol et al also teach the driven member comprises a body fitted with two stub axles that rotate in bearings that define the oscillation axis. The body carries a second magnet designed to move, following the other magnet in such a manner as to

maintain a minimum gap between them [see column 2 lines 4548]. The midplane of the second magnet, which must remain substantially in alignment with the midplane of the other magnet, has a shape that is circular or nearly circular [see column 2 lines 50-53]; the magnet in from of a segment of a cylinder. When the thickness e of the magnet is large, it is preferable for it to be in the form of a segment of a sphere, a spherical cap [see column 2 lines 55-6I]. Figs 3 and 4 show the end portion of an ultrasound probe fitted with a device that complies with the diagrams of FIGS. 1 and 2. The probe comprises a housing closed by a window designed to be applied against a member to be examined (e.g. an organ), generally via a gel for avoiding impedance discontinuities [see column 3 lines I0-I9].

Mayol et al teaches providing a sector probe with means enabling echoes in different firing directions to be displayed in their exact relative positions. Such means may include, in particular, a conventional incremental encoder secured to the shaft [see column 3 lines 41-46]; the encoder is advantageously accompanied by a detector enabling a determined angular position of the probe to be sensed. For example, the detector may comprise a Hall-effect sensor carried by the envelope, and a Hall-effect sensor exciting magnet carried by the head. A second magnet may be mounted symmetrically on the head for balance purposes. Since the Hall-effect sensor is subjected to the action of the first magnet in addition to that of the second magnet [see column 3 lines 46-56]. The probe is intended to scan the eye in depth and it includes a single transducer having a front face whose concave shape is such that pseudo-

focusing takes place slightly in front of the retina when the window is pressed against the eyelids, as shown diagrammatically in FIG. 6 and see column 3 lines 56-68].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine the Saurel et al and the Mayol et al references by using the first and second magnets, the turntable as a rotary driving plate as taught by Mayol et al; in order to allow the transducer to rotate in a desired direction and to sector scan the region of interest with great accuracy.

Regarding claims 8-10, all other limitations are taught as set forth by the above combination.

Saurel et al are silent to a cylindrical gasket.

However, Mayol et al teaches a magnetic drive device enabling a member placed on one side of a non-magnetic wall to be driven by a rotary drive shaft placed on the other side of the wall [see abstract]. Mayol et al further teaches the magnetic drive device whose theoretical structure is shown in FIGS. 1 and 2 comprises a drive shaft that is mounted to rotate about an axis in the direction indicated by arrow f, and in the opposite direction [see column 2 lines 23-30]. The drive shaft is intended to impart oscillating motion about an axis orthogonal to the axis a driven member. The drive member is separated from the shaft by a thin wall of non-magnetic material [see column 2 lines 23-30]. Mayol et al teaches an envelope concentric with the housing receives the drive motor. A partition installed transversely in the envelope carries the shaft via a ball bearing that defines the axis. The driven member comprises a body fitted with stub

axis that rotate in two bearings carried on an extension of the envelope. The body carries the magnet whose outside surface is constituted by a segment of a sphere concentric with the wan [see column 3 lines 28-32].

Mayol et al teach the drive shaft carries a magnet which, in the embodiment shown, is in the form of an axially-magnetized peg, offset from the axis, pointing towards the driven member, and fixed to a turntable which is secured to the shaft. The magnet has circular motion imparted thereto when the shaft rotates, and it is advantageously placed in such a manner that its axis intersects the axis of rotation at the point where it intersects the oscillation axis of rotation or in the vicinity of said point of intersection [see column 2 lines 33-44]. Convex means curving out or bulging outward [see figs 1-2 for the teaching] and the generatrix would be a curved or circular shaped since the outer surface is convex. Sector probe would provide an arc shaped scan. Fig 2 shows the body that contains the transducer mounted around an axis parallel to the longitudinal axis and the doted lines show that the transducer can end as a bevel (bevel is an edge that is not perpendicular but usually about 45 degree, fig 2 clearly show that through the dotted lines). Figs 3-4 show the double walls (envelope and housing) and cylindrical gasket and the radial flange.

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine the Saurel et al and the Mayol et al references; for the purpose of enabling the surface to maintain a good position.

Response to Arguments

3. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL F. BRUTUS whose telephone number is (571)270-3847. The examiner can normally be reached on Mon-Fri 7:30 AM to 5:00 PM (Off alternative Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571)272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. F. B./
Examiner, Art Unit 3768

/Long V Le/
Supervisory Patent Examiner, Art Unit 3768